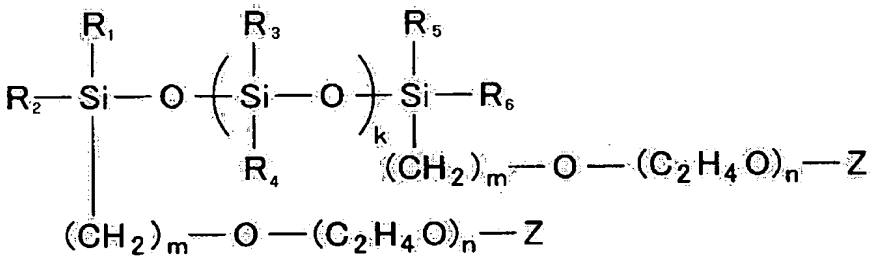
WHAT IS CLAIMED IS:

1. A non-aqueous electrolyte comprising:

a cyclic carbonate;

a lithium salt; and

a polyether-modified silicon oil represented by formulas 1 or 2 in which a polyether chain is bonded to a terminal end of a linear polysiloxane chain:



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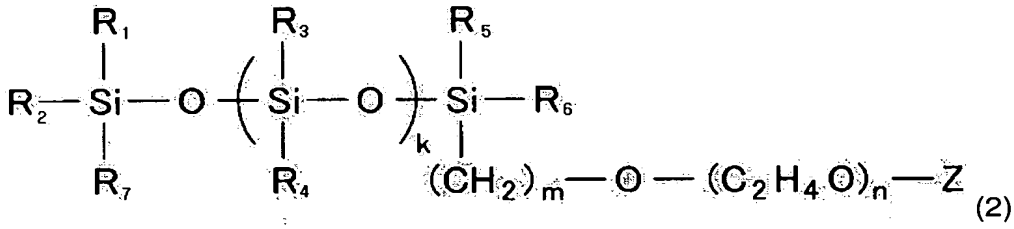


(2)

where k is an integer from 0 to 10;

m is a natural number from 2 to 4;

n is a natural number from 1 to 4;

R_1 to R_7 are independently or identically, selected from hydrogen or C_1 to C_5 alkyls; and

Z is CH_3 or C_2H_5.

2. The electrolyte of claim 1, wherein the polyether-modified silicon oil has a viscosity of less than 10cSt at 25°C.

3. The electrolyte of claim 1, wherein the polyether-modified silicon oil has a flash point of 120°C or more.

4. The electrolyte of claim 1 further comprising a chain carbonate.

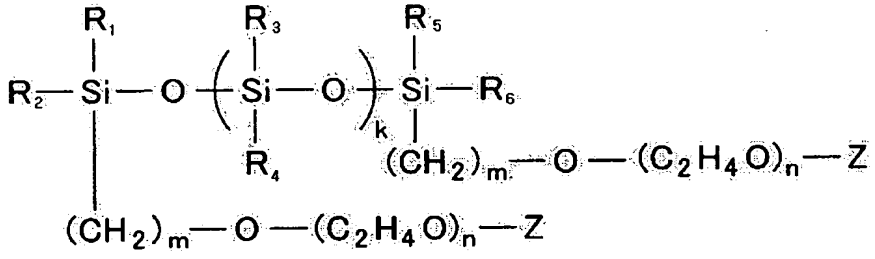
5. The electrolyte of claim 1 further comprising a fluorinated cyclic carbonate.

6. A rechargeable lithium battery comprising:

a positive electrode;

a negative electrode; and

a polyether-modified silicon oil represented by formulas 1 or 2 in which a polyether chain is bonded to a terminal end of a linear polysiloxane chain, a cyclic carbonate and a lithium salt:



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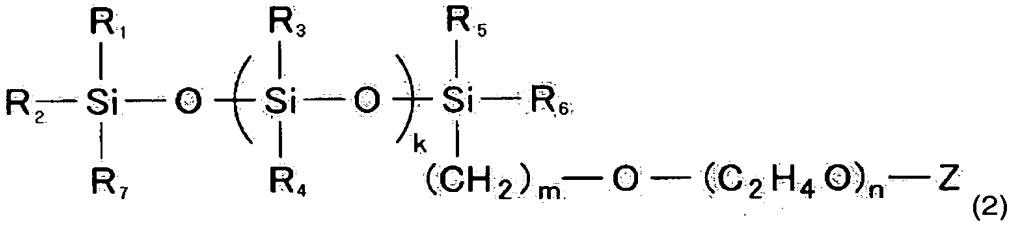

(2)

where k is an integer from 0 to 10;

m is a natural number from 2 to 4;

n is a natural number from 1 to 4;

R_1 to R_7 are independently or identically, selected from hydrogen or C_1 to C_5 alkyls; and

Z is CH_3 or C_2H_5.

7. The rechargeable lithium battery of claim 6, wherein the negative electrode comprises a thin layer comprising a compound selected from the group consisting of polyacrylate compounds, aziridine compounds, fluorinated cyclic carbonates and mixtures thereof.

8. The rechargeable lithium battery of claim 6, wherein the non-aqueous electrolyte further comprises a chain carbonate.

9. The rechargeable lithium battery claim 6, wherein the non-aqueous electrolyte further comprises a fluorinated cyclic carbonate.

10. An electrolyte for a rechargeable lithium battery comprising:

a polyether-modified silicon oil having a viscosity of less than 10cSt, a cyclic carbonate, and a lithium salt.

11. The electrolyte of claim 10, wherein the polyether-modified silicon oil has a flash point of 120°C or more.

12. The electrolyte of claim 10 further comprising a chain carbonate.

13. The electrolyte of claim 10 further comprising a fluorinated cyclic carbonate.

14. A rechargeable lithium battery comprising:

a positive electrode;

a negative electrode; and

an electrolyte comprising a polyether-modified silicon oil having a viscosity of less than 10cSt, a cyclic carbonate, and a lithium salt.

15. The rechargeable lithium battery of claim 14, wherein the negative electrode comprises a thin layer comprising a compound selected from the group consisting of polyacrylate compounds, aziridine compounds, and fluorinated cyclic carbonates, or a combination thereof on a surface thereof.

16. The rechargeable lithium battery of claim 14, wherein the electrolyte further comprises a chain carbonate.

17. The rechargeable lithium battery claim 14, wherein the electrolyte further comprises a fluorinated cyclic carbonate.